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**PPL Energy Services**



# **Powering A Cleaner Future ~ Today**

**John Steckel  
PPL Energy Services  
February 21, 2002**

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# PPL Corporation

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A Fortune 500 Energy Company

- ▶ \$6 billion annual sales, \$12 billion assets
- ▶ 10,000 MW of power plants and growing
- ▶ Electric & Gas Distribution (Domestic & International)
- ▶ Regional Mechanical Contracting & Service Business
- ▶ 85 years of power plant experience
- ▶ [www.pplweb.com](http://www.pplweb.com)



*PPL - EPA Energy Ally of the Year*

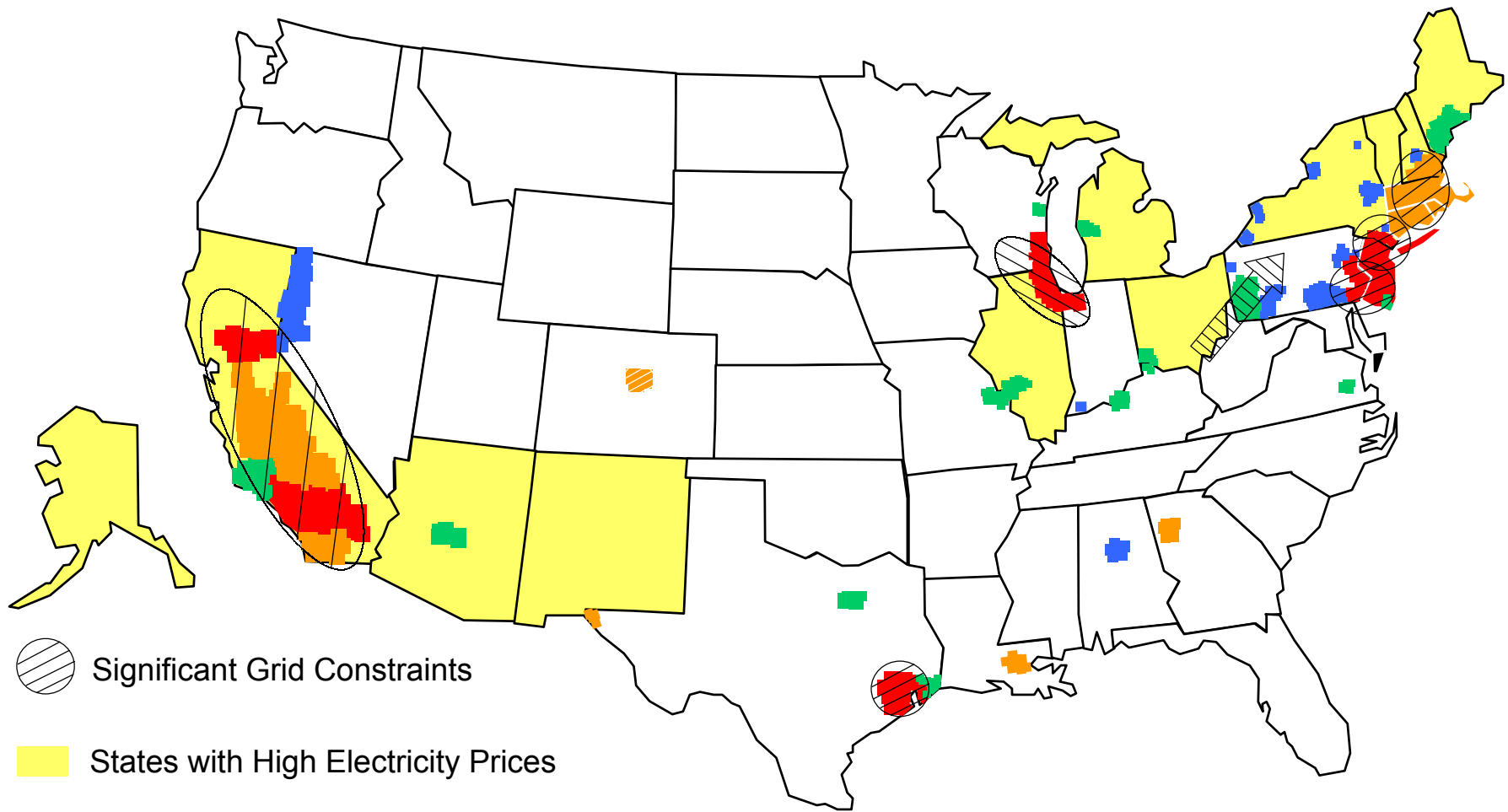


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- ulation
- gs
- er
- logy
- ility & uncertainty
- Legend:
- Restructuring Legislation Enacted<sup>1</sup>
  - Comprehensive Regulatory Order Issued<sup>2</sup>
  - Legislation/Orders Pending<sup>3</sup>



# Convergence of Volatility and Uncertainty



## Ozone Non-Attainment Classifications

Blue square	Marginal	Orange square	Serious
Green square	Moderate	Red square	Extreme (LA) & Severe

Source: Energy Information Administration

# PPL's GenSelect<sup>sm</sup> Distributed Generation Program

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## PPL offers comprehensive solutions

- Fuel Cells - **FuelCell Energy**
- Microturbines - **Capstone, IR, Bowman**
- Engines - various
- Renewable energy solutions
- Design and installation
- Power plant financing, ownership and operation
- Power/Gas purchase and sale



# Examples of PPL DG Projects

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- Standby generators
- fuel cell power plants
- wastewater plant - methane fired microturbines
- gas fired microturbines
- landfill - methane fired generation



# Fuel Cell Power Plant

## 300 kW Power Plant

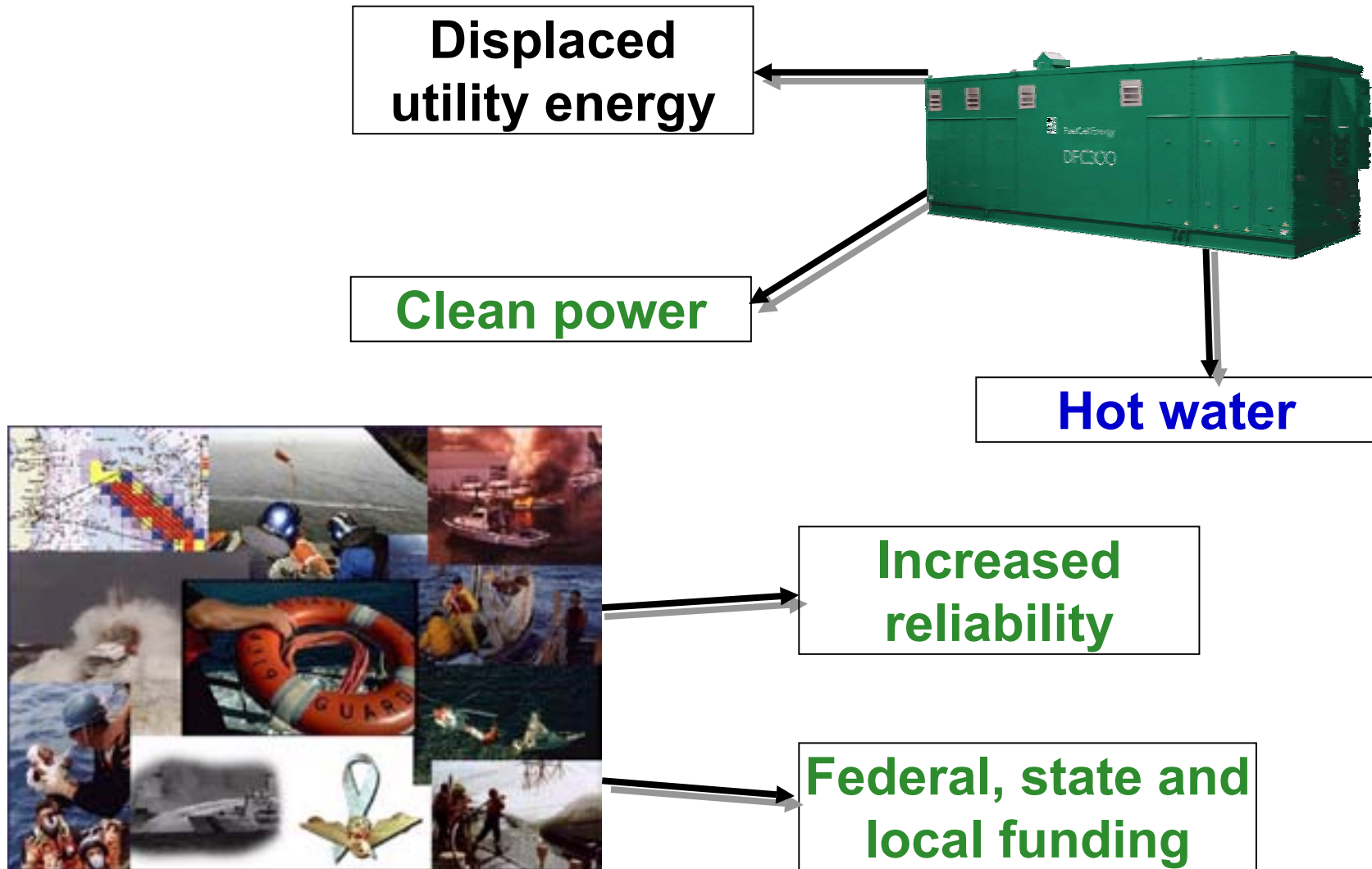
	DFC300
Length (ft)	27.0
Width (ft)	10.5
Height (ft)	11.0
Footprint Are (ft <sup>2</sup> )	284
Weight	45 tons



**DFC300**

**50% electrical efficiency  
75%-80% cogeneration efficiency  
Virtually pollution free**

# U.S. Coast Guard Air Station in Cape Cod

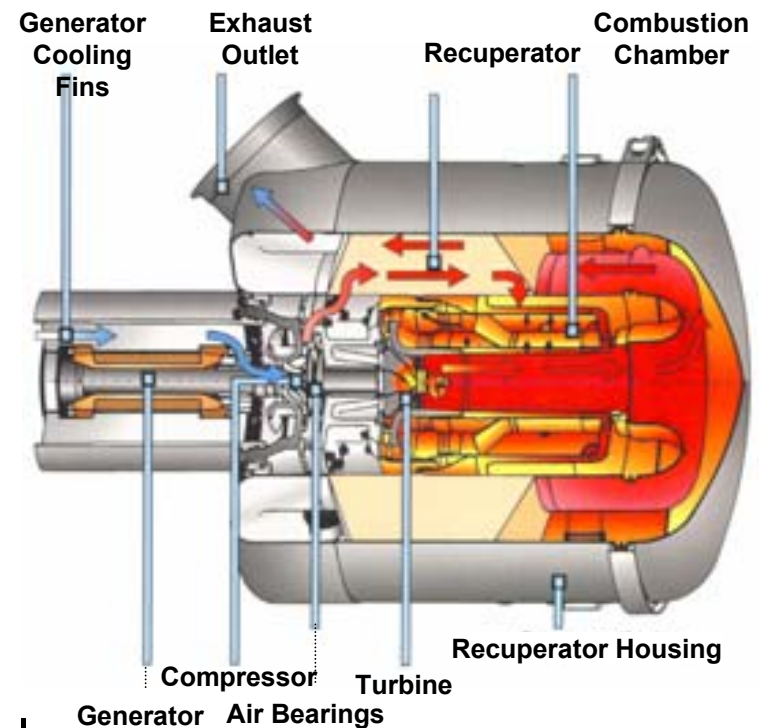




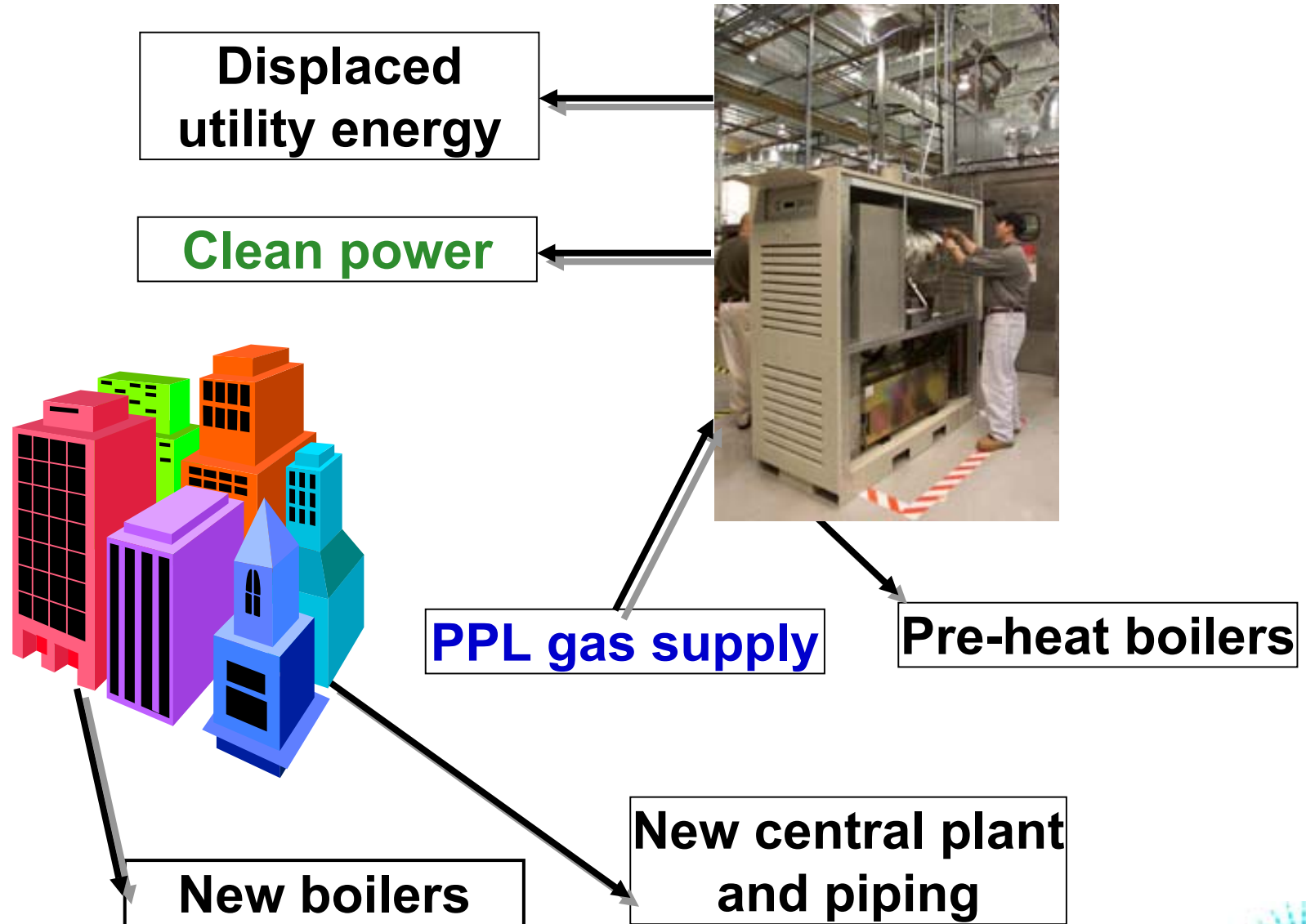
# MicroTurbines

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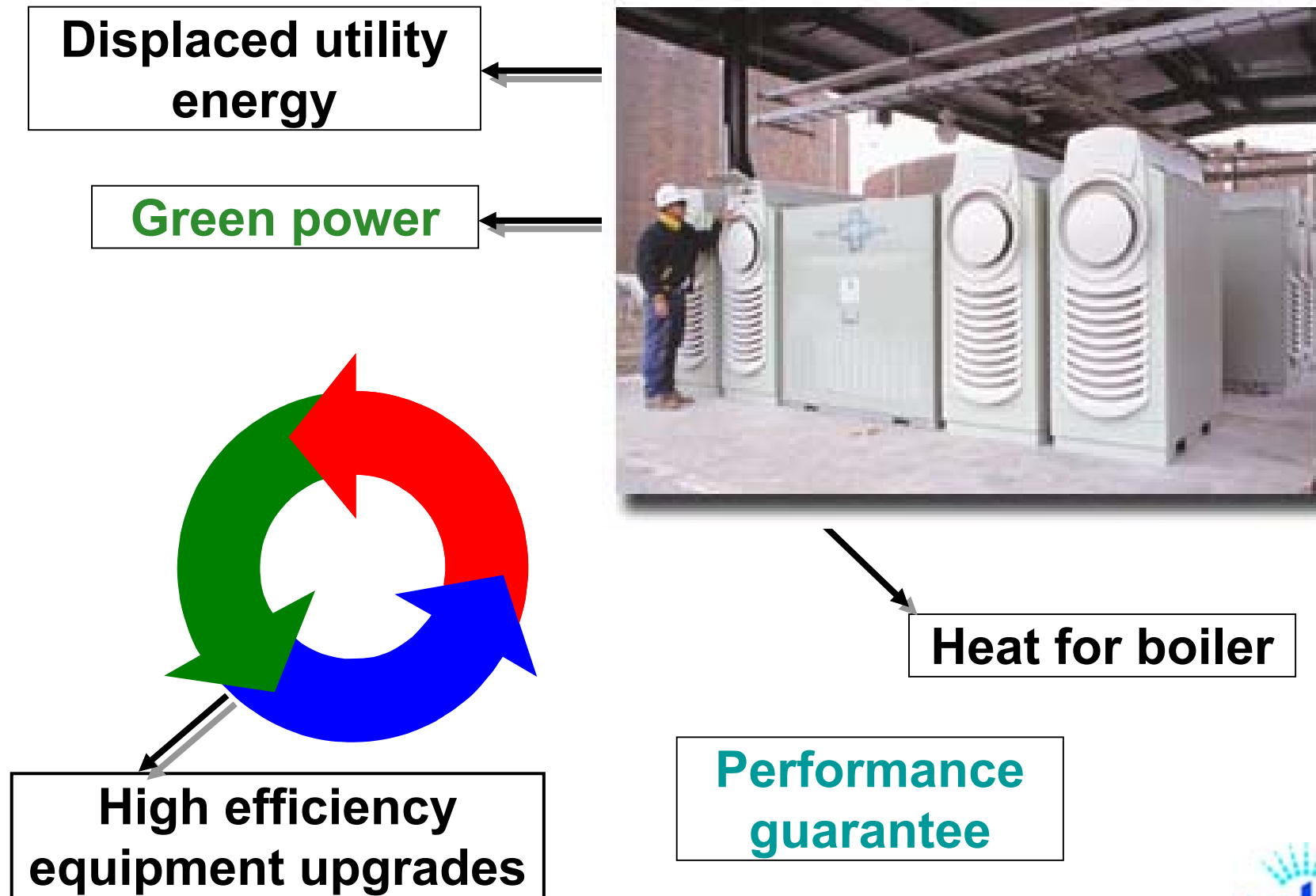
- Technology - gas turbine engine drives generator
- Power Output - 30kW to 70kW per Unit
- Heat Recovery - 200 to 350M Btu/hr
- Efficiency - 26% to 29%
- Natural Gas Feed Demonstrated
- Other Feeds - Need Pre-Treatment
- Low Waste Emissions - Green Power
- Quiet Operation
- Capability for Remote Monitor & Control



# Masonic Retirement Home



# Allentown Wastewater Plant



# Northern Tier Landfill

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- Bradford County, PA
- 800 kW unit
- Market priced electricity\*
- Federal tax credits
- Cogeneration with on-site boiler
- *Green power\**
- *Emission credits\**
- *Selling to gas pipeline*

\* New opportunities since deregulation



# PPL Offers Comprehensive Solutions

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- ▶ Power plant design and installation
- ▶ Optimal heat recovery design
- ▶ Secure all state and federal funding
- ▶ Identify optimal site location
- ▶ Engineer grid backup
- ▶ Design electrical utility interconnection
- ▶ Factor utility tariff implications into economics
- ▶ Expertise in power and fuel markets
- ▶ Provide or negotiate multi-year fuel contract to control prices
- ▶ Operation & maintenance
- ▶ PPL can own, operate and maintain system
  - Sell heat and power for contract term
- ▶ PPL delivery network of local mechanical contractors



# Barriers for DG

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- Unproven Technology (Fuel Cells & Microturbines)
- High Costs (Need for Incentives)
- Utility Interconnection (Case by Case)
- Utility Tariff & Stranded Costs
- Public Awareness/Education
- Environmental Regulations
- Market volatility & uncertainty